

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims

Claims 1-9 (canceled)

Claim 10-19 (withdrawn)

Claim 20 (canceled)

Claims 21-26 (withdrawn)

Claim 27 (previously presented) A method for obtaining an isolated polynucleotide comprising a sequence encoding a protein having Rubisco carboxylation activity, the method comprising:

recombining a plurality of parental polynucleotide species encoding at least one protein having Rubisco carboxylation activity under conditions suitable for sequence shuffling to form a resultant library of sequence-shuffled polynucleotides;

transferring said library into a plurality of host cells, thereby forming a library of transformants wherein sequence-shuffled Rubisco polynucleotides are expressed;

identifying at least one transformant from said library that expresses an enhanced protein having a Rubisco carboxylation activity that is enhanced to an extent that is statistically significant relative to the Rubisco carboxylation activity of proteins encoded by the plurality of parental polynucleotide species, wherein the identified transformant contains a polynucleotide comprising a sequence encoding the enhanced protein; thereby obtaining a polynucleotide comprising a sequence encoding the enhanced protein.

Claim 28 (canceled)

Claim 29 (canceled)

Claim 30 (canceled)

Claim 31 (previously presented) The method of claim 27, wherein the enhanced protein has a K_m for CO_2 that is less than that of proteins encoded by the plurality of polynucleotide species, to an extent that is statistically significant.

Claim 32 (previously presented) The method of claim 27, wherein the enhanced protein has a K_m for O_2 that is greater than that of proteins encoded by the plurality of polynucleotide species, to an extent that is statistically significant.

Claim 33 (previously presented) The method of claim 27, wherein the plurality of parental polynucleotide species encodes at least one Rubisco Form I L subunit.

Claim 34 (previously presented) The method of claim 27, wherein the plurality of parental polynucleotide species encodes at least one Rubisco Form I S subunit

Claim 35 (previously presented) The method of claim 27, wherein the plurality of parental polynucleotide species encodes at least one Rubisco Form II subunit.

Claim 36 (previously presented) The method of claim 27 further comprising a selectable marker gene which affords a means of selection when expressed in chloroplasts.

Claim 37 (previously presented) The method of claim 36, wherein the sequence encoding the enhanced protein and the selectable marker gene are flanked by an upstream flanking recombinogenic sequence having sufficient sequence identity to a chloroplast genome sequence to mediate efficient recombination and a downstream flanking recombinogenic sequence having sufficient sequence identity to a chloroplast genome sequence to mediate efficient recombination.